(c) Each suspension member must be arranged so that, when the ladder is in use on a vessel, the suspension member cannot come in contact with the vessel's side.

(d) Each step must be arranged so that it can bear on the side of the vessel when the ladder is in use.

§ 163.003–17 Strength.

(a) Each pilot ladder must be designed to pass the approval tests in § 163.003–21.

(b) [Reserved]

§ 163.003–21 Approval tests.

(a) *General.* Each approval test must be conducted on a ladder of the longest length for which approval has been requested. If the ladder fails one of the tests, the cause of the failure must be identified and any needed design changes made. After a test failure and any design change, the failed test, and any other previously completed tests affected by the change, must be rerun. Any ladder step that has a residual deflection after testing under this section may not be used thereafter in any ladder represented as Coast Guard approved.

(b) *Visual examination.* Before starting the approval tests, an assembled pilot ladder is examined for evidence of noncompliance with the requirements in §§ 163.003–11, 163.003–13, and 163.003–15.

(c) The following approval tests must be conducted:

(1) *Step flexibility test.* This test is performed on six different steps, one of which must be a molded step and one of which must be a replacement step if special replacement steps are made by the manufacturer. Each step is placed on a pair of supports located at the points where the step would ordinarily be attached to the suspension members. A static load must be applied uniformly for a period of at least one minute over a contact surface that is at the center of the step and is approximately 100 mm (4 in.) wide. The load must be 150 kg (330 lb.) for each molded step that is used only as one of the four bottom steps in the ladder. The load must be 320 kg (700 lb.) for each other step. The deflection of the step is measured while the step is under load and after the load is removed. The step must not deflect more than 20 mm (¾ in.) under the load, and there must be no residual deflection after the load is removed.

(2) *Strength test #1.* An assembled ladder is supported so that a static load, if placed on any of its steps, would exert a force on both the step and each suspension member. A static load of 900 kg (2,000 lb.) is then placed on one step for at least one minute. The load must be uniformly distributed over a contact surface that is approximately 100 mm (4 in.) wide. The center of the contact surface must be at the center of the step. This test is performed on six different steps, one of which must be a molded step. None of the steps may break or crack. No attachment between any step and a suspension member may loosen or break during this test.

(3) *Strength test #2.* An assembled ladder is suspended vertically to its full length. A static load of 900 kg (2,000 lb.) is then applied to the bottom step of the ladder so that it is distributed equally between the suspension members. The suspension members, and inserts must not break, incur any elongation or deformation that remains after the test load is removed, or be damaged in any other way during this test.

(4) *Strength test #3.* A rolled up ladder is attached to anchoring fixtures in a location away from any wall or structure that would prevent it from falling freely, and where it can hang to its full length vertically. The ladder when dropped must unroll freely. When unrolling the ladder, its steps and attachments must not become cracked, broken, or loosened. Other similar damage making the ladder unsafe to use must likewise not occur.

(5) *Step friction test.* One step of each type used on a pilot ladder must be subjected to this test. This test compares the dry and wet surface friction characteristics of ladder steps with those of a standard oak step.

(i) The standard step must have a surface of clean oak that meets S/163.003–11(b) and that is 115 mm (4½ in.) wide by 400 mm (16 in.) long. The stepping surface must have grooves that are 3 mm (⅛ in.) deep and 3 mm wide. The grooves must run in two different